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"Show Me the Money": Vulnerability to Gambling Moderates the Attractiveness of Money Versus Suspense

Cheryl Hahn[1], Timothy D. Wilson[1], Kaichen McRae[1], and Daniel T. Gilbert[2]

Abstract

Do people take risks to obtain rewards or experience suspense? We hypothesized that people vulnerable to gambling are motivated more by the allure of winning money whereas people less vulnerable to gambling are motivated more by the allure of suspense. Consistent with this hypothesis, participants with high scores on a subscale of the Gambling Attitudes and Beliefs Survey—a measure of vulnerability to gambling— reported more of a motivation to earn money (pilot study), were more likely to accept a certain or near-certain amount of money than to gamble for that same amount (Studies 1-2), and worked harder to earn money (Study 3). People vulnerable to gambling also made more accurate predictions about how much they would gamble. People less vulnerable to gambling, in contrast, gambled more than people vulnerable to gambling, but did not know that they would.

Keywords

risk-taking, reward, gambling, individual differences, affective forecasting

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Why do people take risks? The 17th-century philosopher and mathematician Blaise Pascal (1660/2006) suggested one possibility: A gambler may appear to care "about the fun of playing and not about his winnings," he said, "but make him then play for nothing; his interest will not be stimulated, he will become bored" (Pascal, 1660/2006, p. 99). In other words, people may be motivated by the desire to obtain tangible rewards, which is, after all, one of the most fundamental of all human motives. Consistent with this view, research shows that people randomly assigned to gamble for money show bigger increases in heart rate and greater reported excitement than participants randomly assigned to gamble with no stakes (Ladouceur, Sevigny, Blaszczynski, O'Connor, & Lavoie, 2003; Wulfert, Franco, Williams, Roland, & Maxson, 2008; Wulfert, Roland, Hartley, Wang, & Franco, 2005).

But Pascal also noted that there is an allure to risk itself. Give a gambler "every morning the money he might win that day, but on condition that he doesn't gamble, and you will make him quite unhappy" (Pascal, 1660/2006, p. 99). In other words, it may be "the excitement of playing which acts as a reward" for gamblers, "rather than the money" (Raylu & Oei, 2002, p. 1020). Consistent with this view, people in the aforementioned studies who gambled with no stakes also showed increases in arousal and excitement, albeit not as much as people who played for money (Wulfert et al., 2008). After all, if it was only about the money, slot machines would reveal a win or loss instantly after the simple press of a button, instead of drawing out the suspense with spinning reels and flashing lights.

The purpose of the present studies was to disentangle these motives by offering participants Pascal's choice: They could choose a certain win of money (e.g., a 100% chance of winning $2.00) or to gamble for that same amount of money (e.g., a 50% chance of winning $2.00). If people are motivated primarily by the desire to win money, the choice is clear: Go for the sure thing. If people want to experience suspense, however, they might chose to gamble, even though it could be costly to do so.

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There are many theoretical formulations of risk-taking and decision making under uncertainty, including economic models of expected utility (e.g., Bernoulli, 1738/1954; Von Neumann & Morgenstern, 1944) and more recent psychological models of risk (e.g., Kahneman & Tversky, 1979; Lopes, 1987; Rabin & Thaler, 2001; Schneider & Shanteau, 2003). Typically, research in these areas has examined the conditions under which people prefer a sure thing (e.g., a 100% chance of receiving $5) to a risky option with a higher expected value (e.g., an 80% chance of winning $10). As a result, these studies confounded the desire to win money with the desire to experience suspense, because the option that involves maximum suspense (the risky one) also has a higher expected value of reward.

Why haven't previous studies offered people Pascal's choice (e.g., a 100% chance of winning $2.00 or a 50% chance of winning $2.00)? Probably because it seems so obvious what they would do. Why would anyone choose to gamble when they could simply pocket the money? They would do so, we suggest, if their motivation is primarily to experience suspense. Just as people pay money to ride a roller coaster or see a thriller at the local multiplex, so might some participants be willing to pay to experience the fun of gambling. If people's primary motive is to gain financial rewards, however, they will choose the sure win and avoid the risky alternative.

The desire for money versus suspense are both powerful motives and there are undoubtedly many external conditions that trigger one versus the other, such as the amount of money involved. It is also possible that some types of people are motivated more by money than suspense. Indeed, we discovered that a measure of vulnerability to gambling, the Gambling Attitudes and Beliefs Survey (GABS; Breen & Zuckerman, 1999), identifies such people. We used a 15-item version of this inventory, which is especially good at discriminating gambling vulnerability in both student and nonstudent populations (Strong, Breen, & Lejuez, 2004). In Strong et al.'s (2004) words, "The utility of the GABS lies in its potential for tapping cognitions that may potentiate gambling frequency, yet precede significant gambling-related consequences," and as such assesses "an underlying vulnerability to gambling problems" (p. 1516).

Consistent with this conception, scores on the GABS subscale significantly predict the reported frequency of gambling (Callan, Ellard, Shead, & Hodgins, 2008; Neighbors, Lostutter, Larimer, & Takushi, 2002; Strong et al., 2004), as well as scores on these instruments: the South Oaks Gambling Screen, a scale widely used to screen for problem gambling (Brevers et al., 2013; Lesieur & Blume, 1987; Neighbors et al., 2002); the Problem Gambling Severity Index, a measure of the prevalence of problem gambling in the general population (Ferris & Wynne, 2001); the Gambling Urge Scale, a measure of gambling urges in nonclinical samples (Raylu & Oei, 2004); and the Canadian Problem Gambling Index, a measure of the frequency of problem gambling behaviors (Yi & Kanetkar, 2010). We will thus refer to those who score highly on the GABS as "people vulnerable to gambling" and those who score low as "people less vulnerable to gambling."

On the face of it, it might seem that the former type of person would be motivated the most by the allure of suspense. After all, some researchers have characterized gamblers as sensation seekers who throw caution to the winds (e.g., Anderson & Brown, 1984; Coventry & Brown, 1993; Dickerson, 1984; McDaniel & Zuckerman, 2003). But again, most previous studies have confounded risk and reward motivation, by examining people's willingness to engage in gambles that involve both risk and potential monetary gains. When these motives are disentangled, it may be that the allure of suspense is most appealing to people less vulnerable to gambling; as Pascal suggests, these people might be willing to pass up a sure thing in order to experience the excitement of a gamble. Perhaps because they have less experience with gambling, they might find the whir of the slot machine reels and the click-click-click of the ball in the roulette wheel particularly fun and alluring, especially if the stakes are not very high (i.e., as long as they are not risking large sums of money). People vulnerable to gambling, in contrast, might have played more games of chance, and thus have had more opportunity to adapt to them. Or, even without much experience, it is may be the potential winnings that motivate them, such that ironically they are *more* willing to accept a sure win over one that requires them to gamble. The main purpose of the present studies was to test this hypothesis.

Another purpose was to examine how well people can predict what they will do when confronted with Pascal's choice. This is an important question, because if people do not know whether they will find suspense or monetary rewards more appealing, they might place themselves in situations where they are more at risk for gambling than they think they are. Why might someone make the wrong prediction? Knowing what one will do involves an affective forecast, whereby people estimate how they will feel if they chose one alternative over the other. Research has shown that people often make affective forecasting errors when predicting how they will feel in the future (Gilbert & Wilson, 2007; Wilson & Gilbert, 2003). When making affective forecasts, people mentally simulate a future situation (e.g., imagining what it will be like to be playing a slot machine in a casino) and assume that that is how they will feel when in that situation. Often, however, people are in "cold" emotional states when doing the imagining, and find it difficult to simulate the "hot" emotional state they will be in when the event occurs (Gilbert, Gill, & Wilson, 2002; Loewenstein, 1996). In one study, for example, smokers who had recently smoked a cigarette underestimated how much they would crave smoking after going without a cigarette for 12 hr (Sayette, Loewenstein, Griffin, & Black, 2008).

Similarly, people who are not yet in a gambling setting and are thus in a "cold" emotional state might underestimate the appeal gambling will have to them, once they experience the "hot" states of curiosity and suspense (Loewenstein, 1996). We predicted that this would be especially true of people less vulnerable to gambling, given their relative lack of experience. When offered Pascal's choice—a sure win of money or the chance to gamble for that same amount of money—they are likely to predict that they would opt for the sure thing, because that seems like the rational thing to do. Once they are faced with the actual choice, however, they might be more influenced by the allure of suspense than they anticipated. People vulnerable to gambling, in contrast, are likely to opt for the sure thing, given that they are motivated more by financial rewards. And, given their greater experience, they are more likely to anticipate that this is what they will do.

Because the GABS is a relatively new measure of gambling vulnerability, we first report a pilot study examining the extent to which scores on the GABS are correlated with people's reported desire to win money in gambling tasks and the desire for money more generally. We predicted that those high on the GABS Scale would show a greater interest in earning money. In Study 1, we offered people Pascal's choice: On each of several trials, they could choose a sure win of a small amount of money or a gamble for the same amount of money. We predicted that people vulnerable and less vulnerable to gambling would predict that they would prefer the sure win on most trials, but that people less vulnerable to gambling would be more likely to choose to gamble when faced with the actual choice. In Study 2, we made the same prediction in a situation in which participants chose between a near-certain win (90% chance of winning money) and a risky bet (50% chance of winning that same amount of money). In Study 3, we examined reward motivation in a nongambling context, to test the generalizability of the hypothesis that people vulnerable to gambling are motivated more by the desire for financial rewards than those less vulnerable to gambling.

Pilot Study

Method

Participants. Participants were 271 students (199 females, 1 unspecified) who received course credit for their participation. Six were eliminated from the analyses because they had incomplete data on one or more of the measures described below.

Procedure. Participants completed the GABS Scale (Strong et al., 2004) as part of the Department of Psychology's online pretest at the beginning of the semester ($\alpha = .85$). Participants rated their level of agreement with 15 items that assess vulnerability to gambling, chiefly in the areas of belief in luck, illusions of control, and misunderstandings of randomness. Items include, "Sometimes I just know I'm going to have good luck" and "If I have been lucky lately, I should press my bets." Then, as part of an ostensibly unrelated online study, participants completed scales related to monetary incentives in gambling and nongambling contexts. The Chantal, Vallerand, and Vallières (1994) Motivation Toward Gambling Scale consisted of seven subscales. Participants first listed their favorite gambling game and then rated 28 items in terms of why they play that game. The Intrinsic Motivation to Experience Stimulation included items such as "because it is exciting to play for money" and "for the thrill or the strong sensations it gives me." The Extrinsic Motivation External Regulation subscale included items such as "to get rich" and "to buy something that I dream of." The Intrinsic Motivation Toward Accomplishment subscale included items such as "for the feeling of efficacy that I get when I play my favorite game" and "because playing for money allows me to test my capacity to control myself." The Extrinsic Motivation Introjected subscale included items such as "because it makes me feel like somebody important" and "to show others that I am a dynamic person." The Extrinsic Motivation Identified subscale included items such as "because, for me, it is the best way to relax completely" and "because it is the best way I know of to eliminate tension." The Intrinsic Motivation to Know subscale included items such as "for the pleasure I get at improving my knowledge of the game" and "for the satisfaction of learning new ways of playing my favorite game." And finally, the Amotivation subscale included items such as "I play for money, but sometimes I ask myself if I should continue to play my favorite game" and "I play for money, but sometimes ask myself what I get out of it."

We also included the two subscales from the Grouzet et al. (2005) Aspirations Index. The Money subscale assessed participants' aspirations to earn money, including such items as "I will have many expensive possessions" and "I will be financially successful." We included the Self-Acceptance subscale as a filler, to disguise the purpose of the survey. It includes such items as, "I will be efficient" and "I will choose what I do, instead of being pushed along by life." Participants rated both the importance of each goal and the likelihood that it would occur, which were coded separately.

Finally, participants completed the Richins and Dawson (1992) Materialism Scale, which consisted of three subscales: The Acquisition Centrality subscale included items such as "I enjoy spending money on things that aren't practical" and "I like a lot of luxury in my life"; the Defining Success subscale included items such as "I admire people who own expensive homes, cars, and clothes" and "The things I won say a lot about how well I'm doing in life"; the Pursuit of Happiness subscale included items such as "My life would be better if I owned certain things I don't have" and "I'd be happier if I could afford to buy more things."

Table 1. Pilot Study: Correlations of Different Measures With GABS.

Measure	Correlation with GABS
Intrinsic motivation to experience stimulation[a]	.34***
Intrinsic motivation to know[a]	.25***
Intrinsic motivation to experience stimulation[a]	.29***
Extrinsic motivation identified[a]	.25***
Extrinsic motivation introjected[a]	.29***
Extrinsic motivation external regulation[a]	.17**
Amotivation[a]	.02
Materialism: Defining success[b]	.16*
Materialism: Acquisition centrality[b]	.08
Materialism: Pursuit of happiness[b]	.17**
Aspirations to earn money: Likelihood[c]	.17**
Aspirations to earn money: Importance[c]	.09
Aspirations for self-acceptance: Likelihood[c]	.00
Aspirations for self-acceptance: Importance[c]	−.04

Note. GABS = Gambling Attitudes and Beliefs Survey.
[a]From the Chantal, Vallerand, and Vallières (1994) Motivation Toward Gambling Scale.
[b]From the Richins and Dawson (1992) Materialism Scale.
[c]From the Grouzet et al. (2005) Aspirations Index.
*$p < .05$. **$p < .01$. ***$p < .001$.

Results and Discussion

As seen in Table 1, 9 of the 14 measures correlated significantly with the GABS. To examine these relationships in more detail, we entered responses to the scales in a simultaneous multiple regression analysis to predict GABS scores.[1] Two subscales of the Chantal et al. (1994) Motivation Toward Gambling Scale were significant or nearly significant predictors: Intrinsic Motivation to Experience Stimulation, $B = .050$ ($SE = .028$), $t(252) = 1.83$, $p = .069$, and Amotivation, $B = -.056$ ($SE = .021$), $t(252) = 2.71$, $p = .007$. Notably, both of these scales contained items concerning the allure of money. For example, the intrinsic motivation to experience stimulation included the item "because it is exciting to play for money," and the Amotivation scale included the item "I play for money, but sometimes ask myself what I get out of it." The beta weight for the Amotivation scale was negative, reflecting the fact that people vulnerable to gambling had less ambivalence about playing for money than did people less vulnerable to gambling. In addition, the Likelihood of Earning Money Scale of the Grouzet et al. (2005) Aspirations Index was significant, $B = .057$ ($SE = .025$), $t(252) = 2.28$, $p = .023$, reflecting the fact that participants with high scores on the GABS believed that there was a greater likelihood that they would be financially successful.

These results are consistent with our hypothesis that people vulnerable to gambling are motivated more by the desire to win money than those less vulnerable to gambling. In Studies 1 to 3, we tested this hypothesis more directly by observing people's actual choices rather than measuring correlations with other scales. In Study 1, we gave people the choice between a sure win of money and a gamble for that same amount of money, with the prediction that people high and low in vulnerability to gambling would predict that they would prefer the sure win on most trials, but that people less vulnerable to gambling would be more likely to choose the gamble when faced with the actual choice.

Study 1

Method

Participants. Participants were 86 undergraduate psychology students (51 females) who received course credit for their participation.

Procedure. Participants, seen individually, were informed that they would be piloting procedures for future studies and that they would have the opportunity to earn money. They were shown two decks of playing cards, one of which contained 50% red cards and 50% black cards, and the other of which contained 100% red cards. The experimenter explained that the red cards were worth 5 cents and the black cards were worth nothing, and showed the decks to participants so that they could clearly see the probability of winning (selecting a red card) from each one. On each of 40 trials, the experimenter explained that participants would pick a card from the deck of their choice. Thus, if the participant chose the deck with 50% red cards, they had a 50% chance of winning 5 cents, whereas if they chose the deck with 100% red cards, they were certain to win 5 cents.

Participants were then randomly assigned to be forecasters or experiencers. Forecasters predicted how many times they would select each deck on the 40 trials, whereas experiencers actually played the game and selected decks on the 40 trials. After each trial, the experimenter paid the participant (nothing or a nickel), recorded the color of the card selected, replaced the card into the deck, and reshuffled the deck before asking the participant to make another selection.[2]

Participants completed a questionnaire on which they reported their mood and answered questions about their expectations and motivations to gamble. We will postpone a discussion of these measures until Study 2, at which point we will report results that were similar across studies. Participants then completed the GABS (Breen & Zuckerman, 1999) as well as the following individual difference measures, which we included to test the discriminant validity of the GABS:

the impulsivity and sensation seeking subscales of the Impulsive Sensation Seeking Scale (ImpSS; Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993); the Life Orientation Test–Revised (LOT-R), a measure of optimism (Scheier, Carver, & Bridges, 1994); and the Curiosity and Exploration Inventory (CEI; Kashdan, Rose, & Fincham, 2004), which contains two subscales, namely, Exploration (the desire for novelty and challenge) and Absorption (the tendency to engage fully in activities).

Results and Discussion

We performed a multiple regression analysis on the number of times participants predicted they would choose or actually chose the 50–50 deck (out of 40 trials), simultaneously entering participants' condition (0 = forecasters, 1 = experiencers), their standardized score on the GABS (α = .74), and the GABS × Condition interaction. There was a significant effect of condition, $B = 6.99$ ($SE = 2.25$), $t(82) = 3.11$, $p = .003$, reflecting the fact that forecasters predicted they would gamble on fewer trials ($M = 7.88$, $SD = 7.48$) than experiencers actually gambled ($M = 14.48$, $SD = 12.95$). However, this main effect was qualified by a nearly significant Condition × GABS interaction, $B = -4.05$ ($SE = 2.27$), $t(82) = 1.79$, $p = .078$. As hypothesized, the forecasting error was most pronounced among people less vulnerable to gambling: low GABS scorers gambled more than twice as often as low GABS scorers said they would (see the left side of Figure 1). The difference between predicted and actual gambling, for those with GABS scores at one standard deviation below the mean, was significant, $t(82) = 3.48$, $p < .01$. People vulnerable to gambling made more accurate forecasts, as seen in the right side of Figure 1. The difference between predicted and actual gambling, for those with GABS scores at one standard deviation above the mean, was not significant, $t(82) < 1$, *ns*. Interestingly, the simple slope of GABS scores on predictions was nonsignificant, $t(82) < 1$, *ns*. Rather, the difference was in the number of times participants actually chose the 50% deck; the simple slope of GABS scores on actual choices was significant, $t(82) = -2.54$, $p = .013$, supporting the prediction that low GABS scorers would gamble more than high GABS scorers. Finally, although the interaction did not quite reach significance in the regression analysis, when we divided people on the GABS via a median split, and performed a 2 (condition: predictor vs. experience) × 2 (GABS: low vs. high) analysis of variance (ANOVA), the interaction was highly significant, $F(1, 82) = 12.18$, $p < .001$.

None of the other individual difference measures interacted significantly with condition, either from regression analyses, $.10 < ps < .39$, or ANOVAs based on median splits, $.14 < ps < .99$. The GABS was moderately correlated with two of the scales: Impulsivity, $r(86) = .27$, $p < .05$, and Exploration, $r(86) = -.26$, $p = .001$. It was not significantly correlated with any of the other scales, $rs(86) < .19$.

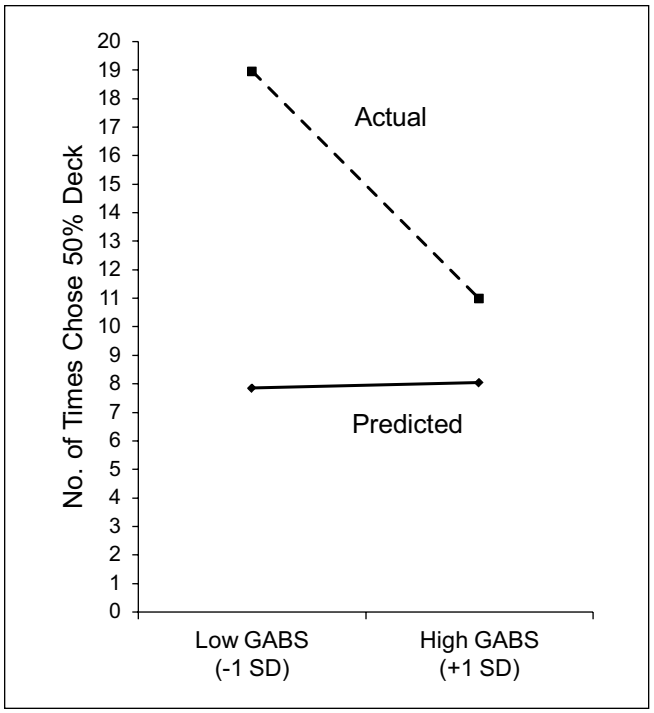

Figure 1. Study 1: The number of trials on which people selected a card from the 50% deck as a function of their condition (actual vs. predicted) and GABS score.
Note. GABS = Gambling Attitudes and Beliefs Survey.

As expected, people vulnerable and less vulnerable to gambling both predicted that they would prefer the sure win over the gamble on most trials. Also as expected, people vulnerable to gambling were right but people less vulnerable to gambling were wrong. When given a choice between a sure win and a gamble, people vulnerable to gambling were more likely to choose the sure win than those less vulnerable. In short, people less vulnerable to gambling were more attracted to risk, though they did not anticipate the extent to which they would be.

The game that participants played was unusual, however, in that one of the options involved a certain win of money. This had the advantage of giving participants a clear choice between monetary gain and the experience of suspense, but it is not a choice that is common in everyday life. In Study 2, we changed the game such that there was no sure win: Participants chose between a deck with 90% or 50% red cards. Not only did this game better approximate real life (where the choice is often between different probabilistic alternatives), it also provided a stricter test of the hypothesis that people less vulnerable to gambling would be lured by suspense more than they anticipated. On the one hand, the 90% deck might be a good compromise between the desire to win money and the desire to experience suspense; after all, it is not certain that one will win. The 50% deck might still be alluring, however, to at least some participants, if their desire was to experience maximal suspense, even if it cost money to do so.

Study 2

Method

Participants. Participants were 35 undergraduate psychology students (30 females) who received course credit for their participation. One participant voiced extreme suspicion about the purpose of the study and was thus dropped from the analyses.

Procedure. The procedure of Study 2 was identical to that of Study 1 except for the following changes: In order to reduce the time the study took to complete, we reduced the number of trials from 40 to 20. In order to keep the potential monetary payoff the same, we increased the payoff for choosing a red card from 5 cents to 10 cents per trial. Participants were asked to choose between a deck of 10 cards that contained 9 red and 1 black cards and a deck that contained 5 red and 5 black cards. Thus, if they chose a card from the first deck, they had a 90% chance of winning 10 cents on that trial, whereas if they chose a card from the second deck, they had a 50% chance of winning 10 cents on that trial. After each trial, the experimenter recorded which deck the participant chose to play, put a dime in a cup if the card they selected was red, put the card back into deck, and shuffled the cards. Finally, for reasons of time we included only two other individual difference scales: the Exploration and Absorption subscales of the CEI (Kashdan et al., 2004).

Results and Discussion

We performed a multiple regression analysis on the number of times participants predicted they would choose or actually chose the 50–50 deck (out of 20 trials), simultaneously entering participants' condition (0 = forecasters, 1 = experiencers), their standardized score on the GABS (α = .79), and the GABS × Condition interaction. The only significant effect was the interaction, $B = 2.74$ ($SE = 1.31$), $t(30) = 2.10$, $p = .045$. As hypothesized, people less vulnerable to gambling committed the forecasting error: Low GABS experiencers chose the 50–50 deck more than three times more often than low GABS forecasters, a difference that was significant, $t(30) = 2.09$, $p = .046$ (see the left side of Figure 2). High GABS forecasters made more accurate forecasts; the difference between predicted and actual choice of the 50% deck was not significant among people vulnerable to gambling, $t(30) < 1$, *ns* (see the right side of Figure 2). Consistent with Study 1, the simple slope of GABS scores on predictions was not significant, $t(30) = 1.52$, $p = .14$. Inconsistent with Study 1, the simple slope of GABS scores on actual choices also failed to reach significance, $t(30) = -1.48$, $p = .15$. Study 2 had less power than Study 1, however, and when the results of the two studies are combined, the simple slope of GABS scores on actual choices is significant, $z = 2.78$, $p = .006$.

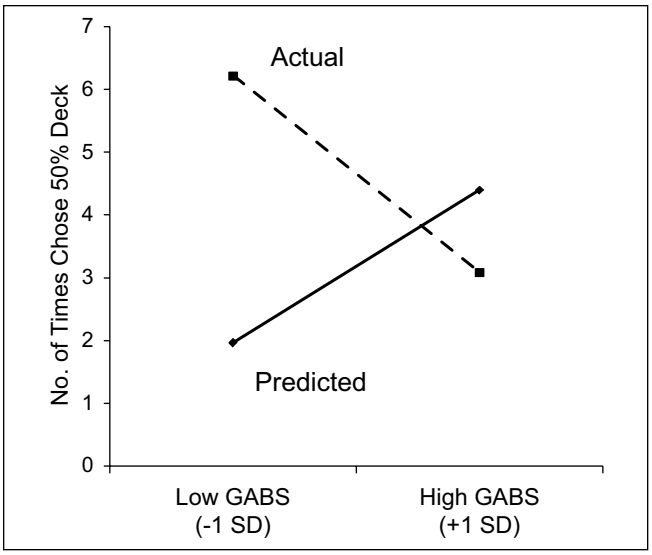

Figure 2. Study 2: The number of trials on which people selected a card from the 50% deck as a function of their condition (actual vs. predicted) and GABS score.
Note. GABS = Gambling Attitudes and Beliefs Survey.

GABS scores were uncorrelated with the Exploration or Absorption scales of the CEI, rs(35) = .08 and −.08, respectively. Nor did either of the CEI scales interact with condition to predict the number of time people chose the 50–50 deck, ts(31) < .68, *ns*.

In both Studies 1 and 2, experiencers completed questionnaire measures after the gambling task that assessed their expectations and motivations. We correlated participants' responses with their GABS score, and report here results that were similar across studies. First, there was no significant relationship between GABS scores and expectations of winning when choosing the 50% deck, rs = −.02 and −.09 in Studies 1 and 2, respectively, suggesting that vulnerability to gambling was not related to unrealistic beliefs about the odds of winning. Nor was there a correlation between GABS scores and participants' reports of how much fun it was to choose a card from the two decks, rs < .06, suggesting that although those with low versus high vulnerability to gambling had different goals on the task, they did not differ in how much fun they experienced. Consistent with the idea that people vulnerable to gambling are motivated by money, high scorers on the GABS reported that they chose the decks based on how much money they could win, $r(17) = .66$, $p = .004$ (we asked this question in Study 2 only). People vulnerable to gambling also reported that, before the gambling task began, they expected to choose fewer cards from the 50% deck than did people less vulnerable to gambling, $r(44) = -.41$, $p = .006$ and $r(17) = -.54$, $p = .025$ in Studies 1 and 2, respectively. Because participants made these ratings after they had made their choices, this finding might reflect post hoc rationalizations rather than accurate recall of their actual expectations.

The results of Studies 1 and 2 support our hypothesis that when given Pascal's choice between a certain or near-certain win and a gamble for that same amount of money, people less vulnerable to gambling tend to prefer risk whereas people vulnerable to gambling tend to prefer money. Ironically, those with high scores on the GABS tended to gamble less than people less vulnerable to gambling. They did so, we believe, because they were motivated more by the prospect of winning money than by the allure of suspense. This portrait of people vulnerable to gambling is quite different from the traditional view that gamblers are motivated primarily by the thrill of risk. But, as noted, most previous studies have failed to disentangle these two motives, by having people play games that involve risk and monetary gain. When the motives are disentangled, it is the person less vulnerable to gambling who is drawn by the allure of suspense, whereas the one vulnerable to gambling seems to be saying, "Show me the money."

Another way to disentangle the desire for risk from money is to eliminate risk entirely and see how hard people work to earn money outside of a gambling context. If people vulnerable to gambling are motivated more by monetary rewards, they should work harder than those less vulnerable to gambling when they are being paid to do a tedious task but not when they are not being paid. We tested this hypothesis in Study 3.

Study 3

Method

Participants. Participants were 69 undergraduate students (53 female) enrolled in psychology classes who received a candy bar for their participation.

Procedure. Students who wished to participate stayed after class for two sessions, 1 week apart. During the first session, they completed the 15 items on the GABS subscale. During the second session, they received a packet that contained 40 math problems (e.g., addition and multiplication problems) and were told that they would have 3 min to solve as many as they could. Those randomly assigned to the monetary reward condition learned that they would be paid 5 cents for each problem they answered correctly and 0 cents for each math problem they answered incorrectly or left blank. Those randomly assigned to the no-reward condition did not receive any instructions about money. The experimenter indicated when participants could start, when they had 30 s left, and when the task was over. Afterward, all participants received a candy bar and $2, regardless of the condition or performance, and were fully debriefed.

Results and Discussion

We performed a multiple regression analysis on the number of math problems participants answered correctly, simultaneously entering participants' condition (0 = no monetary reward, 1 = monetary reward), their standardized score on the GABS (α = .78), and the Condition × GABS interaction. The only significant effect was the interaction, $B = 3.63$ ($SE = 1.54$), $t(65) = 2.36$, $p = .022$. As seen in Figure 3, high GABS scorers solved more problems when money was offered than when it was not, a difference that was significant, $t(65) = 2.15$, $p = .036$. Among low GABS scorers, there was no significant effect of whether money was offered, $t(65) = 1.20$, $p = .24$. Neither the simple slope of GABS scores on number of problems solved in the money nor the no-money condition was significant, ts(65) = 1.05 and −.94, ps = .32 and .35, respectively. The results were similar when the dependent measure was the number of questions participants attempted, regardless of whether they answered them correctly.

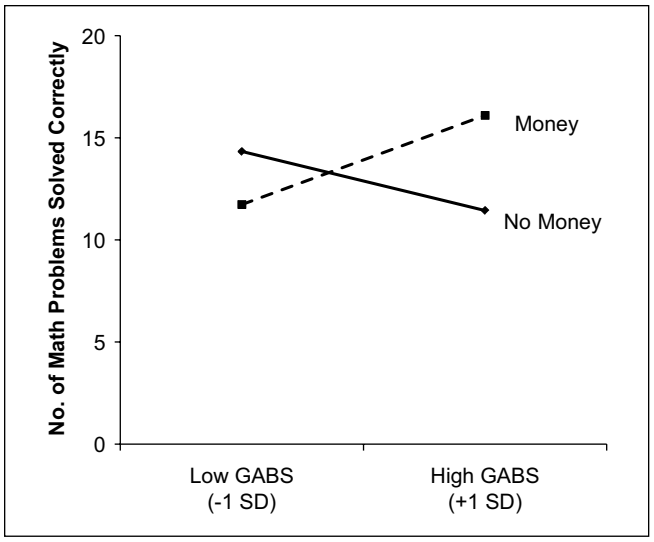

Figure 3. Study 3: The number of math questions people answered correctly as a function of their condition (no money vs. money) and GABS score.
Note. GABS = Gambling Attitudes and Beliefs Survey.

General Discussion

For centuries, philosophers and psychologists have debated why people are drawn to risky activities. As noted by Pascal, one possibility is that people are motivated by the potential rewards that they obtain if the risk pays off, whereas another is that people are motivated by the excitement of risk itself. We hypothesized that both of these are powerful motives, but are prevalent more so in some people than others. Specifically, we found that people vulnerable to gambling (as assessed with the GABS) were motivated more by money, whereas people less vulnerable to gambling were motivated more by risk itself.

These findings have intriguing implications for what draws people into gambling facilities, such as casinos, and

what games people play. Casinos go to great lengths to accentuate the excitement of risk in gambling games, particularly with slot machines, which prolong the suspense with videos, music, and flashing lights. Slot machines have become the most popular form of gambling in casinos and are spreading to other venues such as racetracks (Rivlin, 2004). Our results suggest that it is people less vulnerable to gambling who are especially likely to be drawn to these suspenseful games, and also, that they underestimate their allure, perhaps spending more than they anticipated.

A different portrait of people vulnerable to gambling emerged. First, their predictions about how much they would gamble were more accurate, perhaps because they learned from experience when they are likely to gamble and when they are not. But their accuracy was not because they gambled more than low GABS scorers (and knew that they would) but because they gambled less than low GABS scorers (and knew that they would). On the face of it, this seems like a perplexing result, given that high scores on the GABS Scale are associated with a greater frequency of gambling and greater prevalence of problem gambling. Ours are the first studies, however, to disentangle people's motives by giving them a choice between a sure win and a risky gamble to win that same amount. Interestingly, in this situation, high GABS scorers were more interested in winning money and less interested in gambling, relative to low GABS scorers. Study 3 added further evidence for this difference in motivation between people with low and high vulnerability for gambling: Outside of a gambling context, the latter solved more math problems when they could earn money for doing so than when they could not.

We should note the limitations of the present studies. First, they involved college student populations; thus, the generalizability of the results to nonstudent samples is unknown. Second, the financial stakes in the games people played were quite low; participants could win a maximum of $2.00 in the card games. We have no doubt that if the stakes were much larger—$1000, say—then all participants would choose a sure win over a 50% chance of winning that same amount. The stakes we used were not without ecological validity, however; slot machines in casinos can be played for as little as one cent. Third, participants may have been less likely to gamble if they stood to lose their own money instead of an amount provided by the experimenter.

Fourth, the fact that there were so many trials in Studies 1 and 2 suggests that people who gambled might have been as motivated to avoid boredom as to experience suspense. In Study 1, for example, it might have been monotonous to pick a card from the sure-win deck for 40 consecutive trials, motivating some people to stray occasionally to the 50–50 deck. It will take further research to determine whether people's motivation in this situation was to avoid monotony or experience suspense. The fact remains, however, that participants knew exactly what the game involved in advance, and low-vulnerability forecasters underestimated how much they would want to choose from the 50–50 deck. Furthermore, Study 2 reduced the monotony by having people chose between a 90%-win and 50%-win deck on each of 20 trials. The fact that similar results were found suggests that people less vulnerable to gambling were motivated by the increase in suspense that the 50% deck offered, rather than the desire to avoid extreme monotony.

Perhaps the biggest limitation is that our studies were based on one measure of vulnerability to gambling (the GABS), and the generalizability of our results to other measures is unknown. Furthermore, as with any individual difference measure, it is possible that the results are due to an unmeasured third variable that is correlated with the GABS. In Studies 1 and 2, GABS scores were uncorrelated with beliefs about the odds of winning, ruling out one "third variable" explanation. And, in Study 3, people vulnerable to gambling worked harder to earn money on a tedious task, outside of a gambling context, which is consistent with our hypothesis that the GABS is assessing the desire for financial rewards. Nonetheless, further research on the construct validity of the GABS would be valuable.

With these limitations in mind, we offer the following conclusions: First, people less vulnerable to gambling are, ironically, most at risk for unanticipated gambling than people vulnerable to gambling, given that they underestimated how much they would choose to gamble over accepting a sure win. Second, people vulnerable to gambling are, ironically, less likely to gamble than people less vulnerable to gambling, if the alternative is a sure thing.

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Notes

1. The filler scales (Aspirations for Self-Acceptance: Likelihood and Aspirations for Self-Acceptance: Importance) had more missing data than the others, so we omitted them from the regression. The results are very similar when they are included. The same variables that were significant in the analysis reported here are also significant in the regression that includes the filler scales.
2. After making their predictions, forecasters also played the game. We found, however, that the act of making a prediction tended to change the actual number of trials for which people decided to gamble. Thus, in order to use an unbiased estimate of how much people chose to gamble, we analyzed the data as a between design, comparing the predictions made by forecasters with the actual number of times experiencers chose to gamble.

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